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FINAL STATEMENT OF REASONS

CALIFORNIA CODE OF REGULATIONS

TITLE 8: Chapter 4, Subchapter 4, Article 2, Section 1504, and Article 21, Sections 1637 and 1640 of the Construction Safety Orders (CSO)

Scaffold Design and Use

MODIFICATIONS AND RESPONSE TO COMMENTS RESULTING FROM THE 45-DAY PUBLIC COMMENT PERIOD

There are no modifications to the information contained in the Initial Statement of Reasons except for the following substantive and sufficiently related modification, which is the result of public comment and Board staff evaluation.

Section 1637. General Requirements.

Section 1637 requires that scaffolds be used for all work that cannot be done safely by employees standing on permanent or solid construction at least 20 inches wide, except when such work can be safely done from ladders. In addition, Section 1637 addresses requirements pertaining to the design, construction and use of various types of industry.

New Section 1637(b)(2) requires each scaffold to be designed and constructed to support at least 4 times its own weight (dead load) and 4 times the maximum intended working load (live load) applied or transmitted to it. New Section 1637(b)(2) further defines maximum intended working loads, expressed in pounds per square foot of work platform, for various types of scaffolds.

A modification is proposed to amend the proposed dead load requirement in subsection (b)(2) to read, "Each scaffold shall be designed and constructed using a dead load safety factor that will ensure the scaffold supports, without failure, its own weight and 4 times the maximum intended working load applied or transmitted to it." The proposed modification is the result of public comment and is necessary to provide scaffold design engineers flexibility in calculating and designing a dead load safety factor specific to the type of scaffold system to be used while ensuring that the scaffold will not collapse under its own weight.

Summary and Response to Oral and Written Comments:

I. Written Comments

No written comments were received.

II. Oral Comments

Oral comments received at the March 20, 2003 Public Hearing in Oakland, California. Dialog between Mr. Donald Charles, P.E., President, D.H. Charles Engineering, Inc.; Mr. Larry McCune, Principal Engineer, Research and Standards, Division of Occupational Safety and Health (Division); Mr. John MacLeod, Executive Officer, Occupational Safety and Health Standards Board (OSHSB); Mr. Michael J. Manieri, Principal Safety Engineer, OSHSB; and Mr. Len Welsh, Special Counsel, DOSH Regulatory Development, DOSH.

Comment:

Mr. Charles stated that his company specializes in scaffold design and has been doing so for the past eight years. His attention was drawn to the rulemaking package as a result of the conservative safety factors proposed. He indicated that his own research on scaffold safety factors indicates that a 4 to 1 safety factor for live loading is consistent with industry practice, but that Board Staff's proposed 4 to 1 safety factor for dead loading is too conservative. Again, Mr. Charles reiterated that his research confirms that what is standard in the industry is a design safety factor for live loading of 4 to 1 and 2 to 1 for dead loading. Mr. Charles also stated that a 4 to 1 live load safety factor for scaffolds is understandable and supportable because live loads tend to have unknown factors making it difficult to calculate ahead of time what the live load will be. Consequently, applying a 4 to 1 safety factor is justifiable. However, the same case cannot be made for dead loads where the loading factors can be calculated ahead of time. Mr. Charles stated that a dead load safety factor of 4 to 1 has both safety and cost implications. Mr. MacLeod asked Mr. Charles if there are any national consensus standards that address dead loads and if steel scaffolds had a 1-1/2 factor for dead loads to which Mr. Charles responded that he was not aware of any national consensus standards for dead loads and that the steel codes require a 1-1/2 safety factor but that a 2 to 1 dead load safety factor is sufficient.

The Division interjected that the ANSI scaffold standard requires scaffolds to be able to safely support the dead load and four times the live load. Mr. McCune stated that the Division and Mr. Charles and others (unnamed) in the industry are in agreement that a 2 to 1 dead load safety factor and a 4 to 1 live load safety factor are reasonable. Mr. McCune indicated that an overall 4 to 1 safety factor would be detrimental to scaffold use in high–rise/multi-level applications. Mr. MacLeod asked Mr. McCune if he was involved in the advisory committee process and what the outcome was on this issue. Mr. McCune stated that he did participate in the committee deliberations but that the Division was not able to convince Board staff to use a dead load safety factor of two. Mr. McLeod wanted to know if there was a committee consensus to use an overall dead and live load safety factor of 4 as proposed to which Mr. Manieri explained that the committee did not reach consensus on this issue preferring to allow staff to resolve the matter through additional research. It was Board Staff's understanding based on this research that scaffold manufacturers were supportive of an overall dead and live load safety factor of 4. Mr. Charles disputed the need for imposing an overall 4 to 1 scaffold safety factor to which Mr. Welsh responded that he was unaware of the differing opinions on this issue between staff and the Division and stated that the Division would work with staff to resolve the safety factor issue.

Response:

Board Staff consulted with Mr. David Glabe, Western Falsework Engineering, Inc., also representing the Scaffold Industries Association (SIA) and an ANSI A10.8 committee member; Mr. Don Charles, P.E., President D.H. Charles Engineering, Inc. (commenter), and Mr. Larry McCune, Principal Engineer, Research and Standards, Division of Occupational Safety and Health (Division), regarding the dead load safety factor specified in the proposal. The Division, Mr. Charles and Mr. Glabe have indicated that the proposed 4 to 1 dead load safety factor is problematic in high rise construction as it would require the "double legging" (additional structural reinforcement) of the scaffold system in order to meet the proposed 4 to 1 safety factor. This will invariably lead to higher erection costs to building owners and contractors. Mr. Glabe and Mr. Charles pointed out that dead loads are static factors calculable by the qualified person or engineer responsible for the design and erection of the scaffold system. Scaffold design engineers normally design the scaffold system according to its application, taking into account how high the scaffold will rise, the type of scaffold system and materials (e.g. wood, metal, etc.) to be used, etc. By not specifying a dead load factor, scaffold design engineers will have the flexibility to calculate and design in a dead load safety factor (which can range from a factor of 1 to 2.5) specific to the type of scaffold system to be used. Mr. Glabe and Mr. Charles indicated to staff that this is preferable to specifying a dead load safety factor for all scaffolds.

Mr. Glabe and Mr. Charles agree that national consensus standards, contained in American National Standard (ANSI) A10.8, and Federal OSHA regulations, contained in 29 CFR 1926.451(a)(1), are the most reasonable approach to the issue of scaffold dead load safety factors. These standards specify that each scaffold be designed and constructed to support, without failure, its own weight and at least 4 times the maximum intended working load that is applied or transmitted to it.

Board staff and the Division agree that CSO Section 1637(b)(2) should be modified to be consistent with Federal OSHA regulations and national consensus standards, but also emphasizes the importance of clarifying within the text of Section 1637(b)(2) that persons who design and build scaffolds always use a dead load safety factor that will ensure the scaffold will not fail (collapse) under its own weight. For this reason, Board staff proposes to modify the proposal to state that all scaffolds are to be designed and constructed using a dead load safety factor that will ensure the scaffold supports, without failure, its own weight and 4 times the maximum intended working (live) load applied or transmitted to it.

The Board thanks Mr. Charles for his comment and participation in Board's rulemaking process.

MODIFICATIONS AND RESPONSE TO COMMENTS RESULTING FROM THE 15-DAY NOTICE OF PROPOSED MODIFICATIONS

No further modifications to the information contained in the Initial Statement of Reasons are proposed as a result of the 15-day Notice of Proposed Modifications mailed on April 14, 2003.

Summary and Response to Written Comments:

There were no written comments received except for three letters written in support of the proposed modification from: Mr. Dale Lindemer, PE, National Engineering Manager – Product Applications, Safway Services, Inc., by letter dated April 29, 2003; and Mr. Mark Hammerschmidt of A-1 Plank & Scaffold Manufacturing, Inc., and Mr. David H. Glabe, P.E., Liaison, Scaffold Industry Association (SIA), by fax on May 2, 2003.

ADDITIONAL DOCUMENTS RELIED UPON

None.

ADDITIONAL DOCUMENTS INCORPORATED BY REFERENCE

None.

DETERMINATION OF MANDATE

These regulations do not impose a mandate on local agencies or school districts as indicated in the Initial Statement of Reasons.

ALTERNATIVES CONSIDERED

The Board invited interested persons to present statements or arguments with respect to alternatives to the proposed regulation. No alternative considered by the Board would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons than the adopted action.